

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for establishing ~~configuring~~ lightpaths within an optical ring network, comprising:
 - storing a plurality of requests for a lightpath between a source node in the optical ring network and a destination node in the optical ring network in a queue at the source node;
 - circulating a plurality of tokens on the optical ring network, the plurality of tokens comprising a token associated with a wavelength;
 - wherein the token is adapted to indicate available resource and space on the wavelength and broadcast availability information across the optical ring network;
 - receiving the a token at the source node; ~~of the optical network indicating an available space within a wavelength;~~
 - ~~wherein the token is adapted to bear availability information related to the available space within the wavelength and broadcast the availability information across the optical ring network;~~
 - based upon the availability information, ~~issuing by the source node, of a reservation request;~~
 - selecting a lightpath request from the plurality of requests in the queue of the source node ~~responsive to a best fit window protocol;~~ and
 - updating the token to indicate that the wavelength has been reserved;
 - passing the token to an adjacent downstream node of the optical ring network; and
 - establishing, responsive to selection of the request, the lightpath between the source node and the destination node.
2. (Original) The method of Claim 1, wherein the step of establishing further comprises the step of:
 - updating the token to indicate the wavelength supporting the lightpath is unavailable; and
 - forwarding the updated token to the destination node.
3. (Currently Amended) The method of Claim 1, wherein the step of selecting further comprises a best fit window protocol, the best fit window protocol comprising the steps of:
 - comparing the space available on the wavelength to the plurality of lightpath requests within the best fit window of the queue of the source node, wherein the window size is reconfigurable; and
 - selecting a request having a longest span from the queue that fits within the space available on the wavelength.
4. (Currently Amended) The method of Claim 3 ~~4~~, wherein the step of selecting further comprises the steps of:
 - determining whether a soft deadline associated with any lightpath request in the queue has expired;
 - removing any said lightpath request having an expired soft deadline from the best fit window and inserting said lightpath request in the queue; and
 - selecting the lightpath ~~a removed request in the queue~~ having an oldest expired soft deadline that fits within the space available on the wavelength.
5. (Currently Amended) A method for establishing ~~configuring~~ lightpaths within an optical ring network, comprising:

storing a plurality of requests for a lightpath between a source node in the optical ring network and a destination node in the optical ring network in a queue at the source node;

circulating on the optical ring network, a plurality of tokens, the plurality of tokens comprising a token associated with a wavelength;

receiving a token at a source node of the optical network indicating an available space within a channel;

wherein the token is adapted to bear availability information related to an the available space within the wavelength channel and broadcast the availability information across the optical ring network;

receiving the token at the source node;

based upon the availability information, issuing by the source node, of a reservation request;

determining whether a soft deadline associated with any said lightpath request in a queue at the source node has expired;

if a soft deadline has expired, selecting the lightpath a request having an oldest expired soft deadline that fits with an available space within the wavelength;

if a soft deadline has not expired, comparing a space available on a wavelength to each lightpath request within the queue of the source node;

selecting the lightpath a request having a longest span from the queue that fits within the available space on the wavelength; and

updating the token to indicate that the wavelength has been reserved;

passing the token to an adjacent downstream node of the optical ring network; and

establishing the lightpath between the source node and the destination node.

6. (Original) The method of Claim 5, wherein the step of establishing further comprises the step of:

updating the token to indicate the wavelength supporting the lightpath is unavailable; and forwarding the updated token to the destination node.

7. (Currently Amended) The method of Claim 5, further including the step of storing the lightpath a request in the queue of the source node.

8. (Currently Amended) An optical ring network, comprising:

a source node;

a destination node interconnected with the source node by a plurality of wavelengths, each wavelength associated with a particular channel;

a plurality of tokens adapted to continuously circulate on the optical ring network, the plurality of tokens comprising a token

a token associated with a wavelength each of the plurality of wavelengths, the token and indicating availability of the associated wavelength for supporting a lightpath and broadcasting the availability across the optical ring network; and

wherein the source node is configured to:

store a request for a lightpath between the source node in the optical ring network and the destination node in the optical ring network at the source node;

receive a the token at the source node of the optical network indicating an available space within the a wavelength associated with the token;

~~wherein the token is adapted to bear availability information related to the available space within the wavelength and broadcast the availability information across the optical ring network;~~

wherein the source node is further configured to:

~~based upon the availability information, the source node is adapted to issue a reservation request;~~

~~select a lightpath request from a the queue of the source node responsive to a best fit window protocol; and~~

update the token to indicate that the wavelength has been reserved;

pass the token to an adjacent downstream node of the optical ring network; and

~~establish, responsive to selection of the request, the lightpath between the source node and the destination node.~~

9. (Currently amended) The optical ring network of Claim 8, wherein the source node is further configured to:

update the token to indicate the wavelength supporting the lightpath is unavailable; and
forward the updated token to the destination node.

10. (Currently Amended) The optical ring network of Claim 8, wherein the source node is further configured to utilize a best fit window protocol, the best fit window protocol being adapted to:

compare the space available on the wavelength to each said lightpath request within the best fit window of the queue of the source node, wherein the window size is reconfigurable; and

selecting a request having a longest span from the queue that fits within the space available on the wavelength.

11. (Currently Amended) The optical ring network of Claim 8, wherein the source node is further configured to:

determine whether a soft deadline associated with a lightpath request in the queue at the source node has expired;

removing any said lightpath request having an expired soft deadline from the best fit window and inserting said lightpath request in the queue; and

selecting the lightpath a removed request in the queue having an oldest expired soft deadline that fits within the space available on the wavelength.

12. (Currently Amended) The optical ring network of Claim 8, wherein the source node is further configured to store the lightpath request in the queue of the source node.

13. (Currently Amended) A node within an optical communication ring network, comprising:

a transmitter for transmitting to other nodes within the optical communications ring network;

a receiver for receiving data from the other nodes within the optical communication ring network;

a queue for storing requests for connections between the node and a destination node;
and

a controller, said controller controlled configured to:

store a request for a lightpath in the queue between the node in the optical communication ring network and the destination node in the optical communication ring network;

receive a token from the receiver indicating an available space within a wavelength;

wherein the token is adapted to bear availability information related to the available space within the wavelength and broadcast the availability information across the optical communication ring network;

wherein the controller is further configured to:

~~based upon the availability information, the controller is adapted to issue a reservation request;~~

update the token to indicate that the wavelength associated with the token has been reserved;

pass the token to an adjacent downstream node of the optical communication ring network; and

select the request for the lightpath from the queue responsive to the token ~~using a best fit window protocol~~; and

establish, responsive to selection of the request, the lightpath between the node and the destination node using the transmitter.

14. (Original) The node of Claim 13, wherein the controller is configured to:
update the token to indicate the wavelength supporting the lightpath is unavailable; and
forward the updated token to the destination node using the transmitter.

15. (Currently Amended) The node of Claim 13, wherein the controller is further configured to:
utilize a best fit window protocol, the best fit window protocol being adapted to compare
the space available on a channel to each request within the queue; and
select a request having a longest span from the queue that fits within the space available on the wavelength.

16. (Currently Amended) The node of Claim 13, wherein the controller ~~controlled~~ is further configured to:
determine whether a soft deadline associated with any request in the queue has expired;
remove any request having an expired soft deadline from a best fit window and inserting said request in the queue; and
select an oldest removed request that fits within the space available on the wavelength.

17. (New) The method of Claim 1, wherein the destination node is identical to at least one of the adjacent upstream node and the adjacent downstream node.

18. (New) The method of Claim 1, wherein the optical ring network comprises a Wavelength Division Multiplexing (WDM) ring network.

19. (New) The method of Claim 1, wherein the token is further adapted to free said reserved wavelength.

20. (New) The method of Claim 1, wherein the token bearing the availability information related to the available space within the wavelength achieves a tell-and-go reservation mechanism adapted to transmit data packets immediately after the wavelength has been reserved and without awaiting acknowledgements.

21. (New) The method of Claim 5, wherein the optical ring network comprises a Wavelength Division Multiplexing (WDM) ring network.

22. (New) The method of Claim 5, wherein the token is further adapted to free said reserved wavelength.

23. (New) The method of Claim 5, wherein the token bearing availability information related to the available space within the wavelength achieves a tell-and-go reservation mechanism adapted to transmit data packets immediately after the wavelength has been reserved and without awaiting acknowledgements.

24. (New) The optical ring network of Claim 8, wherein the optical ring network comprises a Wavelength Division Multiplexing (WDM) ring network.

25. (New) The optical ring network of Claim 8, wherein the token is further adapted to free said reserved wavelength.

26. (New) The optical ring network of Claim 8, wherein the token bearing the availability of the associated wavelength achieves a tell-and-go reservation mechanism adapted to transmit data packets immediately after the wavelength has been reserved and without awaiting acknowledgements.

27. (New) The node of Claim 13, wherein the optical ring network comprises a Wavelength Division Multiplexing (WDM) ring network.

28. (New) The node of Claim 13, wherein the token is further adapted to free said reserved wavelength.

29. (New) The node of Claim 13, wherein the token indicating the available space within the wavelength achieves a tell-and-go reservation mechanism adapted to transmit data packets immediately after the wavelength has been reserved and without awaiting acknowledgements.